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Taking Odor Mitigation to the Next Level: A Priority for Iowa Agriculture

A Five-Year Project and Objectives

Odor from livestock and poultry facilities remains a prominent, often divisive issue in Iowa agriculture. This proposal, developed by the Iowa Department of Natural Resources, the Iowa Department of Agriculture and Land Stewardship and Iowa State University, outlines a five-year project of applied odor research involving Iowa livestock producers and facilities statewide, and of research to evaluate emerging technologies. Objectives of the project include:

- Establishment of on-farm applied research projects of odor mitigation strategies and technologies and evaluate design, costs, management and effectiveness. Projects will be conducted at swine, beef, dairy, layers and turkey facilities operated under a variety of production systems.
- Investigation of emerging technologies that show promise but require more laboratory research or pilot-scale evaluations before they can be considered for testing at livestock operations.
- Collection of data from on-farm applied research sites and for all livestock species so that the information may be incorporated into a planning tool that can assist producers in determining the most favorable, neighbor-friendly locations for new facilities.
- Development and distribution of extension educational programs and materials based on the on-farm applied research projects.

Approach and Scope

The five-year project focuses on existing and new swine, beef, dairy, layers and turkey farms. Within the first three years, applied on-farm research sites would be installed on farms across the state to allow testing under different environments. The statewide Iowa State University Extension network will work closely with producer groups, local organizations and others to promote and encourage producer participation in establishing on-farm applied research projects. To help ensure maximum participation by producers, all data will be aggregated across farms before public release as allowed by Iowa Code 455K. Research on emerging technologies will be conducted on the Iowa State University campus and ISU research farms.

Applied on-farm research will include two tiers of projects:

- Tier 1 projects are technologies or strategies that have a firm foundation in research and application, but which would further benefit from the statewide application of studies to strengthen the information and suitability for adoption by producers. The technologies include biofilters for swine facilities, animal diet manipulation, vegetative environmental buffers for swine and layer facilities, siting model as a tool for swine facilities, permeable and impermeable covers of manure storage. Data will be collected for analysis of odor reduction, specific volatile organic compounds reduction (compounds known to be tied closely to livestock odors), costs and maintenance.
- Tier 2 projects are technologies that may not be as well-understood, have an incomplete research and application record or are Tier 1 technologies that need specific research questions answered before they can be applied more widely or under different conditions. Those technologies include advanced biofilters for swine facilities, vegetative

environmental buffers for beef and dairy facilities, biofilters for layer facilities, wet scrubbers for layer and swine facilities, electrostatic particulate ionization for layers and swine facilities, biocurtains for layer and swine facilities, topical treatments for layer and turkey facilities and adapting a siting model for livestock other than swine. To address the research questions posed, data on capital inputs, management and maintenance will be more thoroughly documented than Tier 1 projects. Data (on odor reduction, specific volatile organic compounds reduction, costs and maintenance) also will be collected for longer periods to investigate responses to management and weather conditions.

Emerging technology research will include ultraviolet treatment of ventilation air, solid manure injection systems, a floating oil cover on liquid manure and others.

Benefits

Benefits of the project to the state of Iowa will include:

- Odor mitigation techniques will become better understood thereby accelerating producer adoption.
- Successful on-farm applied research will expand the menu of effective odor mitigation strategies and technologies available to producers.
- Research-grounded information will be shared on mitigation techniques that prove to be ineffective or cost prohibitive.
- The Community Assessment Model, a planning tool for new facilities, will be expanded to include data from many livestock species and be further enhanced to help determine the most favorable, neighbor-friendly locations for proposed operations.

Through information gained from these projects, it is the goal that effective odor mitigation techniques will become better and more widely understood, and to help producers seek out and adopt effective odor mitigation technologies for their operations.